



Case report

An unusual finding in a body recovered from the sea

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ABSTRACT

Post-mortem injuries caused by terrestrial and aquatic animals are commonly encountered in forensic practice. We present a case where an autopsy of a body recovered from the sea showed post-mortem injuries and numerous crustaceans in the heart and lungs. They have gained access to these organs via oro–nasal route and subsequent penetration through mediastinal soft tissues and migration down the trachea.

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1. Introduction

The aquatic environment is rich in both plants and animals and their interaction with dead bodies have been used in forensic investigations. Diatom studies in bodies recovered from water are used to ascertain whether the death was due to drowning and to identify the location of drowning. The potential of benthic organisms in forensic investigations has also been highlighted¹; in one case the presence of a rare species of algae on an assailant's sneakers linked him to a crime scene.² There are other uses where the study of the extent of plant–animal colonization on a body could be used to determine the time of death, the place of death and the route taken by the body in water before being discovered. It had been reported in a case of murder that the studies on the black fly colonies found on the sub-merged car with a murder victim in it provided an accurate estimate of the submersion interval.³

Besides the changes associated with drowning the bodies recovered from water commonly show post-mortem injuries caused by aquatic animals. It is important to recognize these injuries and to differentiate them from ante-mortem injuries. In addition to fish the sea has an enormous variety of arthropods which cause injuries on dead bodies. This report discusses a rare autopsy finding in a body retrieved from the sea.

2. Case report

A 45 year old crew member of a ship fell into the South China Sea when the ship was approaching a nearby harbour and the body was recovered on the second day evening from around the same locality. The place where the body was recovered was about 100 m away from the sea beach and about 20 m deep.

At autopsy the body was almost intact and showed signs of immersion; soiling with water, sand and sea weeds and washer woman's hands. Early putrefactive changes including denudation of epidermis, marbling, bloating of the face and trunk were evident. There was evidence of post-mortem aquatic animal attack on the body. The free border of the pinna of the right ear showed loss of soft tissue and cartilage with scalloped margins due to nibbling by fish or arthropods. There was also loss of major portion of both lips and adjoining soft tissues exposing the teeth. The free borders of the bitten lips and the pinna of the ear showed characteristic scalloped edges. Apart from the above post-mortem injuries there were no deficiencies in the skin due to any ante-mortem or post mortem penetrating injuries including those due to animal attacks.

The extraordinary findings were observed in the chest. On opening the pericardium, some altered blood was found and there was a light purple coloured dead crustacean protruding through a deficiency in the right atrium and another sixteen of them consisting of different sizes were found within the right atrium. There were another eighteen dead crustaceans in the right ventricle (Fig. 1). They were all dead at the time of autopsy and measured 0.4 cm–2 cm. Left atrium and left ventricle were free of crustaceans. Examination of the right atrium revealed two 0.5 cm

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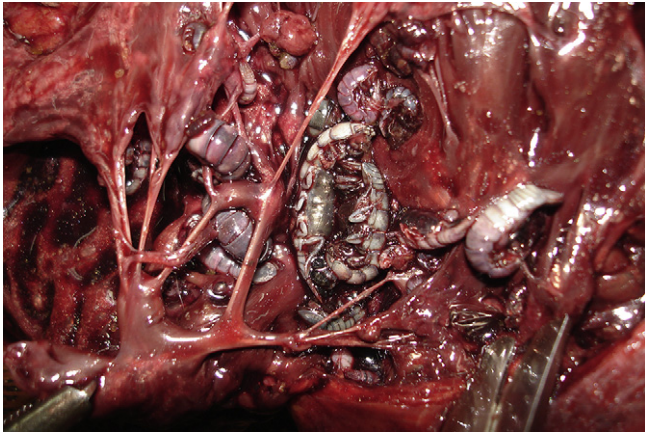


Fig. 1. Dead Cirolanid isopods (different sizes) in the right ventricle.

deficiencies on its posterior wall with perforations in the overlying pericardium. Both the right atrium and right ventricle were free of any post-mortem blood clots. The bellies of the crustaceans were protruding with reddish fluid, probably ingested blood. On dissecting the lungs it was found that both main bronchi and right pulmonary artery were plugged with numerous dead crustaceans at the hila. They were firmly trapped at the two main bronchi and right pulmonary artery at the hilum. The distal parts of the bronchial tree were devoid of them. The entry of these crustaceans is a post-mortem phenomenon and the route of entry was through oro–nasal passage. There was an irregular deficiency in the lower third of the oesophagus indicating that they have gained entry through this deficiency to the mediastinum and then burrowed through soft tissues to the heart. The stomach and intestines were intact and there were no crustaceans.

3. Discussion

The crustaceans found in the body were identified as isopods belonging to the family of cirolanids. Cirolanids are widespread in the ocean and play an important role in maintaining a clean sea environment by their scavenging habits. They are known to be attracted to dead fish and other fauna in the sea and devour them at a very rapid pace aided by their sharp mandibles. The cirolanids in this instance have gained access to the body through the oro–nasal and pharyngeal passages while the body was floating in the sea after death. From the pharynx the cirolanids have travelled in two different directions. One group has travelled down the trachea to be finally lodged in the two main bronchi at the hila of the lungs. The other group of cirolanids have migrated down the oesophagus, pierced through its wall in the lower third, entered the mediastinum, pierced through the pericardium and posterior wall of right atrium. From the right atrium they have followed the natural passage through the atrio-ventricular opening, right ventricle and pulmonary trunk to be lodged in the right pulmonary artery of the hilum of right lung. The routes followed by the cirolanids are substantiated by the presence of a completely intact tracheo-bronchial and ventricular out flow tract and the presence of dead

cirolanids in the mediastinal tissues on their route to the heart. Although the initial passage down the upper respiratory passage may have been aided passively by the water currents, penetration through oesophageal wall, mediastinum, pericardium, heart and lungs was due to active movements of the crustaceans. Some of the cirolanids are known to chew their way through tissues into the carcasses.⁴ Previously isopods have been recovered from subcutaneous tissues in the scalp behind the ear at the autopsy of a dead body found in the sea. These crustaceans have entered the scalp tissues by making circular-oval deficiencies in overlying skin.⁵ Cirolanids are able to live in an anaerobic environment for a short period and it is very likely that they died soon after the body was recovered from the sea.

Finding foreign matter especially in the distal branches of bronchi beyond secondary bronchi is used to indicate death due to drowning. Of course in this instance the presence of the relatively large crustaceans in the respiratory passages does not indicate the cause of death as drowning. And it merely signifies that the body was in the sea and migration of the crustaceans was a post-mortem occurrence. In Japan cirolanids have been used for forensic assessment of dead bodies recovered from the sea. In the present case there was no skin damage and the route of entry was via oro–nasal and oesophageal passages.

Although animal attacks causing injuries on dead bodies is frequently reported, a report of a crustacean entry into the heart and lungs has not been recorded.

Conflict of interest.

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